

Ref: SMC 60600/UST

In the matter of :

US Patent Application No. 10/518,757

Applicants: O'Shaughnessy and Hadjisoteriou

Title: "Disazo dyes and ink jet printing inks containing them"

DECLARATION**BEST AVAILABLE COPY**

I, Dr Gavin Wright, do hereby declare as follows:

1. I am a chemist by profession having been awarded the degrees of Bachelor of Science and Doctor of Philosophy from The Nottingham Trent University.
2. I am employed by Fujifilm Imaging Colorants Limited of Manchester, United Kingdom. I have worked for the company for 10 years as a research chemist in the field of colorants for ink-jet printing technology.
3. I have read US Patent Application No. 10/518,757 and the Office Action mailed 27 March, 2005.
4. In response to the Examiner's remarks that the features of the claims of US Patent Application No. 10/518,757 are obvious over Gregory et al (US 5,374,301) or Shaulin et al (US 5,328,995) I have conducted the following experiments.
5. With regard to pending claim 1 of US Patent Application No. 10/518,757 the closest comparative dye compounds disclosed in Gregory et al, namely Examples 5 and 6, were prepared by method substantially as described therein. Similarly, the closest dye compound disclosed in Schaulin et al, namely Example 29, was also prepared by a method substantially as described therein.
6. The dye of Example 9, at page 10 of the present patent application was prepared in accordance with the method described at page 8, lines 25 to 38.

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7. Inks as shown in Table 1 incorporating the above dye compounds were then prepared by mixing 3.0 g of the dye compound in 97 g of a liquid medium which consisted of 5 parts 2-pyrrolidone, 5 parts thiodiethylene glycol, 1 part Surfynol™ 465 and 89 parts water. Surfynol™ 465 is a surfactant available from Air Products Inc.

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Table 1

Ink	Dye Compound
Ink C1	Gregory et al, Ex 5
Ink C2	Gregory et al, Ex 6
Ink C3	Schaulin et al, Ex 29
Ink 1	Present invention, Ex 9

Each ink described in paragraph 7 above was then ink jet printed onto Canon Photo Paper Pro™ (Canon PR101). The prints so formed were then tested for ozone fastness. The prints were tested by exposing them to 1ppm ozone at 40°C and 55% relative humidity for 96hrs in a Hampden 903 Ozone cabinet. The ozone fastness of the printed ink was then measured by the percentage reduction in the reflectance optical density (ROD) of the print, as calculated from the ROD measurements taken before and after exposure to the ozone. The reflectance optical density measurements were performed using a Gretag Macbeth Spectrolino spectrophotometer.

In a similar fashion, the light fastness of the prints was measured by exposing the prints in an Atlas™ Ci5000 Weatherometer for 200 hours. The light fastness was then measured by the percentage reduction in the ROD of the print, as calculated from the ROD measurements taken before and after exposure to light.

The results are shown in Table 2. For the ozone and light fastness a lower figure indicates better fastness, and value of 0% indicates no reduction in ROD upon exposure.

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BEST AVAILABLE COPYTable 2

Print Example	Ink	Percentage loss in ROD		Dye in the Ink
		Light fastness	Ozone fastness	
1	Ink C1	28	22	Gregory et al, Ex 5
2	Ink C2	26	21	Gregory et al, Ex 6
3	Ink C3	36	43	Schaullin et al, Ex 29
4	Ink 1	19	15	Present invention, Ex 9

8. The results in Table 2 show that the prints made using the Ink 1 containing a dye compound as described in US Patent Application No. 10/518,575 had considerably better ozone fastness and light fastness compared to the prints made with ink containing the closest comparative dyes from Gregory et al or Schaulin et al.
9. The technical advantage of improved light fastness and ozone fastness is highly desirable in many applications to provide prints which are resistant to fading over time.
10. All statements made herein are of my own knowledge are true and all statements made upon information and belief are believed to be true; and further, these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001, and that such willful false statements may jeopardise the validity of the application and any patent issuing thereon.

Signed at Manchester, England this 14th day of JULY, 2006.


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Dr GAVIN WRIGHT